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Valerie Mata

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PATENT COOPERATION TREATY

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| Int'l Appln. No.: | PCT/US00/2854 |
| Int'l Filing Date: | 30 October 2000 |
| Applicant: | Avery Dennison Corporation |
| Title: | *An Apparatus for High-Throughput Production of Coat Material Arrays, and Analytical Methods Using such Arrays* |
| Agent Reference: | 310048-488WO |
| Date of this paper: | 16 October, 2001 |

REPLY TO WRITTEN OPINION

Honorable Commissioner for Patents
Box PCT
Washington D.C. 20231

Gentlemen:

In response to the First Written Opinion of the International Preliminary Examining Authority (IPEA) dated 17 September, 2001, Applicant replies as follows:

I. AMENDMENTS TO THE APPLICATION

In response to the First Written Opinion, Applicant cancels claims 10 and 11 and submits the remaining claims in the substitute sheets provided herein, renumbered

accordingly (12-20 now re-numbered 10-18, respectively). These remaining claims are in exactly the same form as previously submitted, save for the renumbering incurred by the aforementioned cancellations.

## II. REPLY TO COMMENTS UNDER SECTION (V) OF THE WRITTEN OPINION

### Comments with Respect to Lack of Novelty and Inventive Step

Claims 10 and 11 were stated to lack novelty under PCT Article 33(2) as being anticipated by Peters (U.S. Patent 4,299,920, hereinafter '920). As such, claims 9 and 10 have been cancelled.

Claims 1-9 and 12-20 (now renumbered 1-18) were stated to lack an inventive step under PCT Article 33(3) as being obvious over the previously aforementioned '920 patent to Peters and in further view of Machevskaya et al.

The '920 patent teaches a receptacle for the culturing of cell cultures or containment of biological material that may be flexible. However, there is no suggestion in the '920 patent of the use of such a receptacle for the high-throughput analysis of material formulations, as taught by the instant application. Additionally, there is no teaching or suggestion for the use of the receptacle, as disclosed in the '920 patent, in conjunction with a centrifuge for the centrifugal "casting" of materials, as disclosed in the present application, with the centrifugal forces perpendicular (not parallel) to the surface of the sample material, and to the bottom of the receptacle.

Machevskaya et al discloses the effects of varying the viscosities and compositions on the physical and mechanical properties of coatings that are applied by the known prior art method of "spin-coating". However, nowhere in Machevskaya et al. is there disclosed the method of placing an array of well receptacles containing coating samples into a centrifuge, activating said centrifuge to flatten out said coating samples so that the centrifugal force is utilized to flatten out the samples at the bottom of the well receptacles, and with the

force perpendicular to the surface of the sample and to the bottom of the receptacles. This is a type of "spin-casting" technique that is neither found, suggested nor taught by the disclosure of the Machevskaya et al article nor in the '920 patent to Peters.

Combining the teachings of the '920 patent to Peters with the Machevskaya et al. article does not teach or suggest a combination that renders obvious the teachings disclosed in the instant invention, as claimed. Applicant respectfully points out that Machevskaya et al. does not disclose the centrifugal "spin-casting" teachings as disclosed in the present invention. Machevskaya et al. simply discloses "spin-coating" methods for the application of a coating material onto a surface, allowing for the control of thickness of the material deposited, not "spin casting" and particularly not a method for providing samples for high throughput analysis. The Machevskaya et al. method is clearly not applicable to arrays; and the present claims clearly involve centrifugal casting of arrays with the centrifugal force normal to the surface of the samples, instead of parallel to such surface, as shown in the Machevskaya et al. reference. Furthermore there is no teaching or suggestion in either document to combine a multi-chambered receptacle, utilizing the cell culturing receptacle of Peters, with the spin-coating formulation teachings of the Machevskaya et al. article, let alone derive from this unlikely combination, the present invention, wherein arrays of material are centrifuged in order to "cast" them for high-throughput analysis.

Therefore, there is no basis for a lack of inventive step rejection of the claims now presented in the application, in light of the teachings of the Machevskaya et article or the '920 patent to Peters, either taken alone or in combination.

## III. CONCLUSION

The International Preliminary Examination Authority (IPEA) is therefore respectfully requested to issue a second Written Opinion in which the amendments and

arguments submitted in this Reply are carefully considered and in which claims 1-9 and 12-20 are consecutively re-numbered as claims 1-18 and are stated to meet the criteria for novelty under PCT Article 33(2), for inventive step under PCT Article 33(3), and for industrial applicability under PCT Article 33(4). Such review and reconsideration will be greatly appreciated. Thank you.

Respectfully submitted,

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Date: October 16, 2001.

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Enclosed: Substitute Sheets 14, 15 and 16

mounting said receptacle in a centrifuge with the outward centrifugal force being perpendicular to the bottom of said receptacle;

activating said centrifuge to flatten the material in the receptacle; and

drying said material while the sample is being rotated and flattened by the centrifugal action.

8. A method for efficiently preparing a large number of sample castings comprising the steps of:

forming a series of sample receptacles by providing a substrate and an overlying apertured sheet with the apertured sheet in tight sealing engagement with the substrate;

applying different samples of material in liquid form into said receptacles;

drying said samples; and

removing said apertured sheet to leave said material samples on said substrate.

9. A method as defined in claim 8 including the step of applying force to said samples perpendicular to the bottom of said receptacles to flatten out said samples.

10. A method of testing coating materials, comprising the steps of:

providing an array of coating wells, each well being configured for receiving a coating material having a known composition;

placing a coating material having a known composition in each coating well, varying the composition so as to provide a plurality of coating materials having different compositions in a plurality of coating wells;

correlating the composition of the coatings deposited in each of the plurality of coating wells with the position of the coating well in the array, whereby a specific composition is associated with each coating well position in the array;

placing said coating wells with said compositions into a centrifuge, and activating said centrifuge;

drying said coating materials; and

testing the resultant coatings.

11. The method of claim 10 including providing wells in the form of a flexible substitute and a flexible overlying apertured sheet.

12. The method of claim 10 including the step of heating said coating materials while said centrifuge is activated.

13. A method of analyzing coating materials for performance of the coating with regard to a property of a coating, comprising:

providing an array of coating wells, each well being configured for receiving a coating material having a known parameter; said array of coating wells comprising a substrate and an overlying apertured sheet;

placing a coating material having the known parameter in each coating well, varying the parameter so as to provide a plurality of coating materials having different parameter values in a plurality of coating wells;

correlating the value of the parameter for the coatings deposited in each of the plurality of coating wells with the position of the coating well in the array, whereby a parameter value is associated with each coating well position in the array;

drying said coating samples; and

testing the coatings in the array to analyze the relationship between the position in the array and performance with regard to the property of the coating material;

whereby the value of the parameter can be correlated to the performance of the coating with regard to the property of the coating.

14. The method of claim 13, further comprising the steps of:

providing a coating well apparatus having at least a substrate part and a well wall part which can be separated;

separating the well wall part from the substrate part after drying, whereby the coating material array is carried by the substrate alone after separation.

15. The method of claim 13, wherein the well depth and volume is substantially greater than that of the coating volume.

16. A method of analyzing coating materials for performance of the coating with regard to a property of a coating, comprising:

providing an array of coating wells, each well being configured for receiving a coating material having a known parameter;

placing a coating material having the known parameter in each coating well, varying the parameter so as to provide a plurality of coating materials having different parameter values in a plurality of coating wells;

correlating the value of the parameter for the coatings deposited in each of the plurality of coating wells with the position of the coating well in the array, whereby a parameter value is associated with each coating well position in the array;

applying a centrifugal force to the array of coating wells to level the coating material in the coating wells;

curing said coating samples under said coating leveling force; and

testing the coatings in the array to analyze the relationship between the position in the array and performance with regard to the property of the coating material;

whereby the value of the parameter can be correlated to the performance of the coating with regard to the property of the coating.

17. The method of claim 16, further comprising the steps of:

providing a coating well apparatus having at least a substrate part and a well wall part which can be separated;

separating the well wall part from the substrate part after application of the leveling force, whereby the coating material array is carried by the substrate alone after separation.

18. The method of claim 10, further comprising the steps of:

curving the said array of coating wells to substantially match the curvature of the curvilinear path of the array during centrifuging.